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Electrochemical Sensors for Vanadium Determination

Gogol E., Denisov E., Lunev I., Egorova O., Sharipova L., Gusev Y.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© Published under licence by IOP Publishing Ltd. This paper is dedicated to the problem of vanadium (V) determination by the means of voltammetry. The comparison of results obtained for two types of sensor: volume glassy-carbon electrode and screen printed carbon electrode are presented. The experimental data is recorded using the hardware and software of Novocontrol (Germany): electrochemical interface POT/GAL 15V 10A, frequency response analyzer Alpha-A, and software for data collection and data processing WinDETA. Two three-electrode cells has been studied: for the first one the bulk glassy carbon electrode, and for the second one the screen printed electrodes has been used as the working electrode. In the first case the reference electrode has been made from silver chloride and the counter electrode from steel wire. In case of the screen printed electrodes, the electrodes were placed on the same plate. The peak of vanadium (V) was obtained under the potential of 1.3 V. It was found that the growth of the vanadium concentration increases magnitude of the cathode current measured then the mentioned potential is applied. The screen printed carbon electrodes provides better sensitivity in comparison with the volume glassy-carbon electrodes due to the more explicit vanadium potential peak.

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Keywords

Screen Printed Carbon Electrode, Vadium (V), Voltammogram, Volume Glassy-Carbon Electrode

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